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EXAMINER

WIESE, NOAH S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Status of Application

1. Acknowledgement is made of amendments filed 04/15/2009. Upon entering the amendments, the claims 2-4 and 11-14 are amended.
2. The claims 1-23, 27-28, 32-33, 39-40, 43, 47, 52, and 55 are pending and presented for the examination.

Objections Withdrawn

3. Claims 2-4 have been amended to overcome the objections set forth in the previous office action. Therefore, the objections to the claims have been withdrawn.

Rejections Withdrawn

4. The doubling patenting rejections previously issued are withdrawn upon the receipt of a terminal disclaimer with the co-pending application.

The amendments to claims 2-4 overcome the indefiniteness rejections previously issued. The rejections are therefore withdrawn.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claims 11, 13-23, 27-28, 32-33, 39-40, 43, 47, and 52 are rejected under 35 U.S.C. 102(e) as being anticipated by Cropley et al (US 6811905).

Regarding **claim 11**, Cropley et al teaches a methanol fuel cell that can be used in an alternative method to produce hydrogen. The fuel cell comprises a membrane with electrodes on opposing sides, wherein a methanol and water fuel mixture is introduced

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to one electrode and oxygen is introduced to the opposing electrode. Cropley also teaches a means for supplying an oxidizing agent and fuel containing an organic compound to opposite electrodes. Cropley teaches that there is a means for collecting (discharging) methanol, water, and carbon dioxide (see column 7, lines 25-35). This means is located at the anode (fuel electrode) side of the fuel cell and thus would be capable of collecting hydrogen if it was generated on this electrode. Therefore, it is a functionally equivalent means to that of the amended claim 11. The hydrogen generating system taught by Cropley et al meets all of the structural limitations of instant claim 11, and therefore anticipates the claim.

Regarding **claim 13**, Cropley teaches that the apparatus can be used for producing electrical energy, indicating a means for withdrawing electric energy from the cell. Thus, the Cropley apparatus is structurally equivalent to the apparatus of instant claims.

Regarding **claim 14**, Cropley teaches that the hydrogen production method can be performed by providing an electrical current to the cell, indicating a means for providing electric energy from outside (see column 15, lines 29-35). In this configuration the electrode receiving the fuel would function as the cathode.

Regarding **claims 15-17 and 19**, the voltage between the electrodes in a generating system such as is taught by Cropley is drawn to the use of said system and does not relate to the structure of the system. As such, the method of use limitations of claims 15-17 and 19 do not hold patentable weight in the product claims. Therefore,

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because Cropley teaches a system that is equivalent structurally to that of claims 11 and 14, the dependent claims 15-17 and 19 are also anticipated by the prior art.

Regarding **claims 18, 20-23, and 27-28**, the limitations regarding varying of certain parameters during the use of the hydrogen generating system are process limitations. They therefore do not hold patentable weight in the product claims 18, 20-23, and 27-28. As such, the claims do not further limit claims 11, 13, and 14, and so they are anticipated by Cropley, which teaches a structurally equivalent system.

Regarding **claims 32-33**, the limitations regarding the operation temperature of the system are process limitations. They therefore do not hold patentable weight in the product claims 32-33. As such, the claims do not further limit claim 11, and so they are anticipated by Cropley, which teaches a structurally equivalent system.

Regarding **claims 39-40**, Cropley teaches that the membrane is a proton conducting solid electrolyte membrane (see claim 1), and preferably, a perfluorosulfonic acid membrane (see column 10, lines 40-43).

Regarding **claim 43**, Cropley teaches that the anode (fuel electrode) comprises a platinum-ruthenium film (see column 4, lines 20-23). The film can be dispersed a support such as carbon (see column 8, lines 57-62).

Regarding **claim 47**, Cropley teaches that the cathode (oxidizing electrode) comprises a platinum film that can be supported on carbon powder (see column 4, lines 24-25 and column 8, lines 57-62).

Regarding **claim 52**, Cropley teaches that liquid fuel (a mixture of organic compound and water) is circulated for cooling of the cell, indicating a means for circulating fuel (see column 11, lines 41-42).

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cropley et al (US 6811905) in view of Quang et al (US 4840783).

Regarding **claim 55**, the claim differs from Cropley et al because Cropley does not teach a carbon dioxide absorbing portion for removing carbon dioxide from the produced hydrogen gas. However, it would have been obvious to modify Cropley in view of Quang et al in order to add such an absorbing portion to the system because Quang teaches a method of producing hydrogen from methanol involving an advantageous carbon dioxide absorbing portion (see claim 18). One of ordinary skill would have been motivated to include such an absorbing portion because doing so would result in a product gas produced by the Cropley system having a higher hydrogen purity. One would have expected reasonable success in the modification because Cropley teaches that hydrogen can be produced from the inventive system and Quang teaches a method for removing carbon dioxide from such produced hydrogen-containing gas. Therefore, claim 55 is obvious and not patentably distinct over the prior art of record.

Response to Arguments

9. Applicant's arguments filed 04/15/2009 have been fully considered but are not persuasive at overcoming the rejections previously set forth. The amendments to claim 11 do not distinguish the claim over the prior art because the apparatus taught by Cropley et al has a means for removing product gasses from the anode (fuel electrode) side of the membrane that could function to collect hydrogen-containing gas generated on said anode if the apparatus was to be used for this purpose. Because claim 11 is an apparatus claim, a limitation drawn to a means for carrying out a certain process is only distinguishing over a prior art apparatus if corresponding means in the prior art apparatus is not capable of functioning in the way prescribed in the claims. In the instant case, the Cropley apparatus contains a corresponding means to the hydrogen collecting means of the amended claim 11, and the means would be capable of performing the collection task because Cropley teaches that it is for collecting a gas (see column 7, lines 25-35). Thus, this portion of the Cropley apparatus reads on the newly added hydrogen collecting means of instant claims, and thus the amendment is not distinguishing.

Claim 11 is further amended to state that the apparatus is configured to operate in an open circuit configuration. However, it is not clear what being "configured" to operate in a certain manner means structurally for the claimed apparatus. The apparatus taught by Cropley contains all of the structurally components of instant claims, so it is equivalent to the claimed hydrogen generation system. Designating that the claimed system is "configured" to operate in a certain intended way does not

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distinguish the system over an equivalent one that would be capable of equivalent operating conditions.

The amendment to claim 13 does not distinguish the claim over the prior art because a means for withdrawing electricity from the cell is structurally equivalent to a means for introducing energy across the cell. Therefore, the structure of the Cropley apparatus meets the limitations of the claim even though Cropley does not specify that electricity is withdrawn. Similarly, the amendment to claim 14 does not distinguish the claim because in the cell taught by Cropley the two electrodes are connected in a circuit for providing external energy. This configuration is equivalent to that of claim 14.

For the above reasons, the arguments regarding the amendments to the claims are not persuasive and the previously issued grounds of rejection are maintained for claims 11, 13-23, 27-28, 32-33, 39-40, 43, 47, and 52.

Thus, the rejection previously issued is maintained for the reasons set forth above.

Allowable Subject Matter

10. Claims 1-10 are allowed. The following is an examiner's statement of reasons for allowance: The prior art of record, either alone or in combination, fails to anticipate or render obvious the instantly claimed method of producing hydrogen wherein fuel and oxidizing agent are introduced at two electrodes at opposite sides of a membrane, and wherein the hydrogen gas is generated at the fuel electrode (the anode).

11. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the

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base claim and any intervening claims. The prior art fails to teach or suggest a hydrogen generating system having the configuration of instant claim 11 and wherein neither electrode is connected to a means for withdrawing or providing electrical energy.

Conclusion

13. Claims 11, 13-23, 27-28, 32-33, 39-40, 43, 47, and 52 are rejected. Claims 1-10 are allowed. Claim 12 is objected to.

14. Applicant's arguments are not persuasive, and the previously issued art rejections are maintained. Therefore, **THIS ACTION IS MADE FINAL.**

15. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NOAH S. WIESE whose telephone number is (571)270-3596. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENZO/

Supervisory Patent Examiner, Art Unit 1793

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